

2000B047/RMH10053

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: )  
J. C. Cheng et al )  
Confirmation No. 2046 )  
Serial No. 09/619,560 ) Examiner: W.D. Griffin  
Filed: July 19, 2000 ) Group Art Unit: 1764  
For: ALKYLAROMATICS PRODUCTION )

DECLARATION UNDER 37 C.F.R. 1.132

Commissioner for Patents  
Washington, DC 20231

Sir:

I, JANE CHENG, declare:

(1) THAT I am a citizen of United States of America, currently residing at 1303 Pinhorn Drive, Bridgewater, NJ 08807;

(2) THAT I received a Bachelor of Science Degree in Chemistry from Peking University, Beijing, China in 1981; and that I received a Ph. D. Degree in Organic Chemistry from Lehigh University in 1986; and further that I am employed by Exxon Mobil Research and Engineering Company, and at present hold the position of Advanced Research Associate at Corporate Strategic Research, in Annandale, New Jersey;

(3) THAT I have been employed by Exxon Mobil Research and Engineering and its predecessors, as a researcher in the field of aromatics alkylation using molecular sieves and at present hold the position of Advanced Research Associate;

(4) THAT I am an inventor of the subject matter described and claimed in the patent application identified above;

(5) THAT I directed the preparation of a sample containing a 2:1 weight ratio of mordenite and MCM-22 for the purpose of comparing the

CONSIDERED

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performance of such a mixture with MCM-22 catalyst and TEA-Mordenite catalyst for cumene synthesis via benzene/polyisopropylbenzene transalkylation;

(6) THAT under my direction 0.5 g of MCM-22 and 1.0 g of TEA-mordenite, as described in examples 3 and 4 of the present application, were mixed thoroughly and used for transalkylation. The catalyst mixture was diluted with sand to 5.5 cc and charged to the reactor. The same procedure described in Example 2 of the present specification was followed to start the run. The catalyst was tested at 4.0 total WHSV (based on 1.5 g of catalyst) and DIPB conversion was 49%. Catalyst performance at this conversion level is shown as Example 8 of TABLE A below which otherwise contains the same data as TABLE 1 of the specification;

TABLE A

Example	2	3	4	5	6	7	8
Catalyst	Beta	MCM-22	TEA-Mordenite	1:1 MCM-22 and TEA-Mordenite Physical Mixture	1:1 MCM-22 and TEA-Mordenite Coextruded	1:1 MCM-22 and Beta Physical Mixture	1:2 MCM-22/ TEA-Mordenite Physical mixture
WHSV	2.4	1.1	6.3	3.0	3.0	1.3	4.0
Days on Stream	9.9	8.9	5.9	4.9	10.9	5.9	1.9
DIPB Conv, %	49.5	50.3	52.2	51.3	53.2	52.4	48.8
TIPB Conv, %	10.6	26.8	-1.4	9.5	27.9	27.8	4.3
m-DIPB Conv, %	41.1	37.6	47.8	43.3	45.7	44.2	41.2
o-DIPB Conv, %	69.9	93.4	2.5	75.6	64.2	93.5	46.1
p-DIPB Conv, %	59.1	63.7	63.3	60.2	62.8	62.2	59.5
Cumene Sel, %	98.2	98.5	99.2	99.0	99.3	98.6	99.3
n-C3-Bz/Cum, ppm	766	1056	870	777	722	644	760
EB/Cum, ppm	96	384	124	173	120	176	179
Selectivity, wt%							
lights	0.708	0.859	0.286	0.325	0.199	0.606	0.114
Toluene	0.004	0.009	0.008	0.012	0.004	0.006	0.013
EB	0.009	0.038	0.012	0.017	0.012	0.017	0.018
Cumene	98.184	98.451	99.233	99.043	99.339	98.603	99.296
n-C3-Bz	0.075	0.104	0.086	0.077	0.072	0.064	0.075
2,2-DiPh-C3	0.648	0.203	0.238	0.218	0.136	0.370	0.226
Cumene dimer	0.277	0.279	0.078	0.210	0.159	0.323	0.182
Others	0.094	0.057	0.057	0.098	0.080	0.011	0.075
Sum	100.00	100.00	100.00	100.00	100.00	100.00	100.00

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(7) THAT the results in Table A show that, to achieve a constant DIPB conversion of 50%, zeolite beta alone can be operated at 2.4 WHSV, MCM-22 alone at 1.1, and TEA-mordenite at 6.3 WHSV, while mixing TEA-mordenite and MCM-22 in 1:1 weight ratio provides a quite active catalyst which can be operated at 3.0 WHSV; moreover, mixing TEA-mordenite and MCM-22 in a 2:1 weight ratio permits operation at 4.0 WHSV, a 33% improvement over the corresponding 1:1 weight ratio mixture;

(8) THAT furthermore, the 2:1 mixture of TEA-mordenite and MCM-22 mixture not only permitted use of a higher space velocity, but also surprisingly provided the same or enhanced selectivity at 99.3% for the desired monoalkylbenzene product, cumene, at this higher space velocity than either TEA-mordenite alone, MCM-22 alone, or the 1:1 mixture of TEA-mordenite and MCM-22 (both for physical mixture (Example 5) and coextruded product (Example 6);

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I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing therefrom.

  
JANE CHENG10/21/2002

Date

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CERTIFICATE OF MAILING UNDER 37 CFR 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

Commissioner for Patents  
Washington, D.C. 20231

on October \_\_, 2002.